SECOND SERIES. No. 45.

JUNE, MDCCCLXIX.

THE ZOOLOGIST:

A Monthly Journal

OF

NATURAL HISTORY,

FOR

RECORDING FACTS AND ANECDOTES

RELATING TO

QUADRUPEDS, BIRDS, REPTILES, FISHES AND INSECTS.

No. CCCXXXVI. or S. S. No. 45.

LONDON:
JOHN VAN VOORST, PATERNOSTER ROW.

Price ONE SHILLING.

Notes on the Zoology of Newfoundland.

By HENRY REEKS, Esq., F.L.S., &c.

(Continued from Zool. S. S. 1614).

Letter 2.—ORNITHOLOGY.

Mottled Owl, or *American Screech Owl,* Scops Asio (*Linn.*)—A summer migrant to Newfoundland, and tolerably common. As this is one of the commonest owls in North America, it seems strange that Mr. Downs should not meet with it in Nova Scotia, especially as it frequents the States bordering on the Atlantic more than inland.

American Longeared Owl, Otus Wilsonianus, *Lesson.*—Not common: I only examined one specimen, which was killed near Cow Head. It appears to be a summer migrant.

American Shorteared Owl, Brachyotus Cassini, *Brewer.*—Not common, but I think rather more so than Otus Wilsonianus. It is a summer migrant.

Barred Owl, Syrnium nebulosum (*Forster*).—Apparently a summer migrant, but not common; at least I only obtained one specimen, shot at Cow Head in September, 1866.

Saw-whet Owl, Nyctale acadia (*Gmelin.*)—Not uncommon, and well known to the settlers as the "saw-whet." I only obtained one specimen, which was picked up dead at Cow Head, and appeared to be uninjured. It is a summer migrant.

Sparrow Owl, Nyctale Richardsoni, *Bonap.*—I include this species on the authority of Mr. Downs, who states, in his "Notes on the Land Birds of Nova Scotia," that it is "abundant in Newfoundland;" but, strange to say, I never met with a single specimen, neither were the settlers acquainted with the species: I have very little doubt, however, that it occurs on the island. It is this species which closely resembles the European Nyctea Tengmalmi, but not having specimens I am unable to point out the distinctive characters.

Snowy Owl, Nyctea nivea (*Daudin*).—Tolerably common, and probably remains in Newfoundland throughout the year, although very rarely seen during the summer months, but this may be owing to its following in the wake of its chief prey, the polar hare (*Lepus glacialis*), and ptarmigan (*Lagopus rupestris*), which retire to the high land as soon as the snow partially disappears. The "white owl," as the settlers term this species, is a bold, rapacious bird, and not easily

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driven from its slaughtered prey. One of the specimens which I obtained at Cow Head was feeding on an eider duck—probably a wounded bird which it had killed—and was twice knocked over with stones, the last time apparently killed, before it would relinquish the duck: it had, however, sufficient life and strength to force its claws into the arm of the man who picked it up, although protected with all the clothes he usually wore. A large Newfoundland dog, used for retrieving seals, &c., refused to go near this bird after it was knocked down with stones: the men who were present assured me that the bird kept making a "hissing" noise, apparently at the sight of the dog. During my residence in Newfoundland I heard several amusing anecdotes of the snowy owl, but, although I can vouch for the truth of them, it is scarcely necessary to reproduce them all in the pages of the 'Zoologist:" I will, however, relate one or two which I do not think have before appeared in print. William Youngs, of Codroy (Newfoundland), having continually had the bait stolen from one of his fox-traps, determined to watch the trap and shoot the robber: for this purpose he selected a fine moonlight night, with snow on the ground, and, with his gun in his hand, a white swan-skin frock on, and a white handkerchief tied round his cap, he secreted himself in a small bush about twenty yards from his trap, fully determined to shoot the first comer; but his determination proved fruitless, for a large white owl —probably the thief—seeing something white sticking up through the centre of the bush, and evidently mistaking it for a fine plump willow grouse, instantly made a "stoop," and, at the same time, sending its claws almost to the man's brains, suddenly disappeared with the cap and white handkerchief: the man was so startled for the moment that he was unable to shoot at the bird. The snowy owl is a frequent attendant—although generally unnoticed—of the sportsman, and often succeeds in carrying off a grouse or duck before the retriever gets to it. On one occasion some men were waiting in ice "gazes" for the purpose of shooting wild geese (*Bernicla canadensis* and *B. brenta*), when one of them, named James Carter, left his "gaze" to go and have a chat with his neighbour, incautiously leaving his new white swan-skin cuffs and gun behind him. He had scarcely left his "gaze" when an unseen enemy, in the shape of a fine snowy owl, pounced in and succeeded in getting clear off again with both of the white cuffs. A fine adult bird of this species entered my host's house, *via* the chimney, and fought so valiantly for its life that the man had to kill it with a "pew"—a piece of pointed iron fastened to a wooden handle about four feet long, and used for throwing codfish from the boats. A good many snowy owls are annually caught in the fox-traps of the settlers; and when very fat, which they frequently are, are considered good eating by many, and I see no reason why they should not be so, but I could never sufficiently overcome my repugnance to birds of prey as food to taste one. None of the settlers appeared to know anything of the breeding of this bird, although Mr. Downs states that it "breeds in Newfoundland." Mr. Cordeaux has kindly examined parasites of Nyctea nivea from Newfoundland, and informs me that they are identical with others from European specimens.

Hawk Owl, Surnia ulula (*Linn.*)—Perhaps the commonest owl in Newfoundland, or, from being a day-flying species, is more frequently seen than any other. It is a bold, familiar bird, generally found in the neighbourhood of houses, preying on chicken, tame pigeons, &c., —remaining throughout the year, but not so abundant in the depth of winter as at other seasons. In the fall of the year, and probably at other times, the hawk owl has a habit of perching on the bare and dead top of high fir trees, from which it commands a good view of the immediate neighbourhood, and suddenly drops upon any unfortunate object in the shape of food that may happen to pass within a convenient distance.

PICIDÆ. The Woodpeckers.

Hairy Woodpecker, or *Sapsucker,* Picus villosus, *Linn.*—Tolerably common, and does not migrate. Newfoundland specimens appear to agree with Professor Baird's variety—*medius.*

Downy Woodpecker, or *Sapsucker,* P. pubescens, *Linn.*—Very common, and like the preceding species is non-migratory.

Blackbacked Threetoed Woodpecker, Picoides arcticus (*Swains.*)—This fine species is tolerably common in Newfoundland throughout the year; and often, when the snow is drifting through these dreary forests, no other sign of animal life is noticeable than the "woodpecker tapping" in search of the larvæ of several fine species of Sirex which abound there.

Banded Threetoed Woodpecker, Picoides hirsutus (*Vieill.*)—Scarcely so common as the preceding species, but, like that, is a resident throughout the year: I shot several males, but had a difficulty in getting a female, though I succeeded at last in killing one specimen; it is a rather darker bird than the male, and is without the yellow patch on the crown, having that part spotted with white. The transverse bands on the back are similar to those on the male.

Black Woodcock, or *Log Cock*, Hylatomus pileatus (*Linn.*)—This is the "great black woodpecker" of the Newfoundland settlers, and appears to be rather rare, as I did not meet with it during my stay there: it is probably a summer migrant.

Flicker, Colaptes auratus (*Linn.*)—This species is a summer visitor to Newfoundland, where it is called the "English Woodpecker," and is tolerably common. It has a peculiar note, which bears a fancied resemblance to that of the green woodpecker (*Picus viridis*); hence the name bestowed on it by the settlers.

Three other species of woodpecker probably occur in Newfoundland, but I did not meet with them, viz., Sphyrapicus varius (*Linn.*), Centurus carolinus (*Linn.*), and Melanerpes erythrocephalus (*Linn.*)

CYPSELIDÆ. The Swifts.

American Chimney Swallow, Chætura pelasgia (*Linn.*)—Apparently rare; at least at Cow Head. I only examined one specimen, shot in June, 1868. It is, of course, a summer migrant.

American Night Hawk, Chordiles popetue (*Vieill.*)—Well known to the settlers as the "night hawk," but I did not meet with a specimen. It is a summer migrant.

ALCEDINIDÆ. The Kingfishers.

Belted Kingfisher, Ceryle alcyon (*Linn.*) — Tolerably common during the summer months, and, like the British species of kingfisher, builds in banks, often at a considerable depth, and lays five or six white eggs. I have always found the belted kingfisher a very shy bird, and difficult to get a shot at.

TYRANNIDÆ. The Tyrant Flycatchers.

King Bird, or *Bee Martin*, Tyrannus carolinensis (*Linn.*)—Visits Newfoundland for nidification, and is tolerably abundant. I have shot them after the first fall of snow in the autumn.

Pewee, Sayornis fuscus (*Gmelin.*)—A summer migrant, but not common.

Wood Pewee, Contopus virens (*Linn.*)—A summer migrant, arriving in May. Not common.

Least Flycatcher, Empidonax minimus, *Baird.*—A single specimen obtained in the month of June, 1868. It is a summer migrant.

Greencrested Flycatcher, Empidonax acadicus (*Gmelin.*)—Not very common; frequents woods in the neighbourhood of houses, and is a summer migrant.

Yellowbellied Flycatcher, Empidonax flaviventris, *Baird.* — Apparently a common summer migrant, arriving in May.

TURDIDÆ. The Thrushes.

Hermit Thrush, T. Pallasi, *Cabanis.*—A common summer visitor, and tolerably good songster: arrives about the middle of May.

Wilson's Thrush, T. fuscescens, *Stephens.*—A summer migrant, but not so common as the preceding species. One specimen obtained in May 1868.

Olivebacked Thrush, T. Swainsoni, *Cab.*—A summer migrant, but scarcely so common as T. Pallasi.

Migratory Thrush, or *American Robin*, T. migratorius, *Linn.* A summer migrant, and by far the commonest of all the Turdidæ. Arrives in April, and soon commences building: I have taken the eggs early in May. This bird is called the "robin" by the English settlers, evidently from its redbreast and familiarity: it is, however, about the size of the fieldfare (*T. pilaris*), and much resembles that bird in habits. The eggs are not quite so large, and of an unspotted blue. A pair of these birds occupied the same nest at Cow Head for six consecutive years. Considering the vast number of "robins" which annually breed in Newfoundland, this habit may account for the scarcity of old nests, so apparent in passing through the thick fir woods.

Blue Bird, Sialia sialis (*Linn.*)—A summer migrant, and said by the settlers to be occasionally common; I did not, however, meet with it.

Rubycrowned Wren, Regulus calendula (*Linn.*)—Not uncommon; arrives in Newfoundland in May.

[*Hydrobata Mexicana*, Bonap.—Has this species really occurred in Nova Scotia? *Vide* Downs on the "Land Birds of Nova Scotia."]

SYLVICOLIDÆ. The Warblers.

American Tit Lark, Anthus ludovicianus (*Gmelin.*)—I do not think this bird breeds in Newfoundland, as I have only seen it in August, or during the autumnal migration.

Black and White Creeper, Mniotilta varia (*Linn.*)—Apparently a common summer migrant.

Maryland Yellowthroat, Geothlypis trichas (*Linn.*)—A summer migrant; common.

Nashville Warbler, Helminthophaga ruficapilla (*Wilson*). — A summer migrant, but apparently rare. One specimen obtained in June, 1868.

Oven Bird, or *Golden-crowned Thrush*, Siurus Aurocapillus (*Linn.*) —A summer migrant, but not common.

Blackthroated Green Warbler, Dendrœca virens (*Gmelin.*)—A summer migrant, and tolerably common, arriving towards the latter end of May.

Yellowrumped Warbler, D. coronata (*Linn.*)—A common summer migrant, arriving early in May.

Baybreasted Warbler, D. castanea. (*Wilson*).—Tolerably common; arrives in Newfoundland early in June.

Chestnut-sided Warbler, D. pennsylvanica (*Linn.*) — Tolerably common throughout the summer.

Blackpoll Warbler, D. striata (*Forster*).—Apparently not uncommon in summer.

Yellow Warbler, D. æstiva (*Gmelin.*)—A common summer migrant, and called by the settlers "yellow-hammer." It makes a pretty little nest in low bushes, somewhat resembling that of our English goldfinch.

Yellow Red-poll Warbler, D. palmarum (*Gmelin.*)—One of the earliest spring migrants, and tolerably common.

Black and Yellow Warbler, Dendrœca maculosa (*Gmelin.*)—Arrives in May, and is tolerably common.

Green Black-cap Flycatcher, Myiodioctes pusillus (*Wilson*).—A summer migrant; arrives in June, but is not very common.

Canada Flycatcher, M. canadensis (*Linn.*)—Arrives in June, but not common.

American Redstart, Setophaga ruticilla (*Linn.*)—A summer migrant, but rare in the north of Newfoundland: it is called "goldfinch" by the English settlers. Arrives about the middle of May.

HIRUNDINIDÆ. The Swallows.

Barn Swallow, Hirundo horreorum, *Barton*. — A rare summer migrant at Cow Head.

Cliff Swallow, H. lunifrons, *Say*.—An equally rare summer migrant with the preceding species.

Whitebellied Swallow, H. bicolor, *Vieill.*—A summer migrant, and very common at Cow Head; in fact, the only species of swallow to be seen there throughout the summer.

Bank Swallow, or *Sand Martin*, Cotyle riparia (*Linn.*)—Very rare at Cow Head, but said to be very common about the Bay of St. George, and further south.

HENRY REEKS.

Thruxton, Andover.

Notes on some of the rarer Birds noticed in Suffolk in 1868.

By ALEXANDER CLARK-KENNEDY, Esq.

MAY.

Iceland Falcon.—A good specimen of this rare species was shot by a fisherman near Aldeburgh, at the beginning of this month, as I am informed by my friend Dr. Hele, of that town.

Hawfinch.—May 9. A male hawfinch, which had been kept in a cage for more than a month, was allowed to escape to-day: he had been caught by a boy, with one wing broken, and otherwise hurt, but, under skilful doctoring, he got quite well again.

Yellow Wagtail.—On the 12th I observed a great number of these birds near the village of Snape; they are not common here, although many single birds are seen throughout the summer.

Redshank.—14th. An immense number of these birds were breeding at this date in some marshy ground near Iken and Snape, on the banks of the Alde, a few miles from here: they nest in this locality every year, but I am sorry to say their numbers are rapidly decreasing, as are those of the green plover, common and lesser terns, ringed dotterel, and other birds which breed between Orford and Aldeburgh.

Merlin.—On the 22nd I saw one of these hawks giving chase to a redshank, and several have been killed near Woodbridge this spring.

Quails.—30th. Several quails were seen during the last week at Padworth, in this county, and others near Scole, on the borders of Norfolk and Suffolk.

JUNE.

Greater Spotted Woodpecker.—On the 14th I found a young bird of this species fluttering on the ground near its nest, from which it had probably fallen, in Glemham Park: I could plainly hear the noise made by the rest of the young birds in their nest, and the old bird flew on to the tree near which I was standing and commenced tapping upon the bark until I left, when she flew away again. A pair were lately seen in the same park.

Lesser Spotted Woodpecker.—16th. Observed a lesser spotted woodpecker climbing a tree in the park, and doubtless it had a nest near, but I was unable to discover its whereabouts.

Bee-eater. *—One of these rare and lovely birds was seen upon a cherry tree by several gardeners, while working in the garden at Glemham Hall, upon one of the early days of the present week. The head-gardener, upon seeing the bird,—which he knew to be very scarce,—ran for his gun, but luckily the wary stranger made good its escape before he returned.

JULY.

Hoopoe.—On the afternoon of the 2nd of this month, while walking across some meadows about a mile from Glemham, I was much surprised to see a hoopoe fly past me, so near as to be able with certainty to recognize the species; indeed I could easily have shot it. A pair have also been observed in the vicinity of Aldeburgh on several occasions last month, and very probably this was one of the same birds.

Swift.—Was last seen on the 30th, near Glemham.

SEPTEMBER.

Kingfishers.—Have received a great addition to their numbers since the summer.

Jack Snipe.—I shot one of these snipe upon the 23rd, and flushed another at the same time, and since that date to the end of the month have killed ten; but the day on which I shot the first bird was most unusually early for the jack snipe to reach this county, although the common species is here in greater or less numbers the whole year round.

Black Tern.—I saw one flying up the river Alde on the 25th.

Redshank.—A pair were shot by a gamekeeper on the 26th, as they flew up from a small pond in the park, which is at least ten miles from the coast.

Stone Curlew.—A pair were killed on Westleton Common early in the month, and Mr. Spalding informed me that he saw one on the same heath last month.

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* From my experience of gardeners' Ornithology, I should be inclined to doubt their competency to identify a rare species. In this case their description of colour only might apply to the roller (*Coracias garrula*).—ED.

OCTOBER.

Pied Sparrow.—On the 1st, in a large flock of house sparrows, I noticed one individual with white wings and tail and otherwise pied.

Northern Diver.—One of these divers was disporting himself in the river close to a bridge which spans the Alde at Snape: I wounded him badly, but he managed to escape with a broken leg, at which I was vexed, for the poor creature was probably in great pain: it is a rare bird here, but the redthroated diver often makes its appearance in winter.

Whimbrel.—I observed five on the 2nd, near Iken.

Green Sandpiper.—On the 6th one was seen feeding in a stream near Snape, and since that date I have seen several others in the marshes.

Spotted Rail.—I killed a male upon the 7th as it flew from a reedbed near Snape, but, being shot with No. 4, it was too much damaged for preservation: I saw two others on the 12th.

Roughlegged Buzzard.—On the 7th one of these buzzards was seen hovering over a pond in which were some tame ducks, near Saxmundham, and as he was swooping down at one of them a man named Hillen shot the bird, which was a finely plumaged male.

Grey Plover.—14th. Several seen on the mud-flats near the river, but very wild and unapproachable.

Osprey.—An osprey was captured by some sailors while in the north sea at the beginning of the month, and was brought to Ipswich, where it seems doing well.

Little Stint.—I shot one out of a flock of four, on the 15th, at Thorpe, near Aldeburgh; and another on the 17th: a friend also killed a third near Thorpe.

Richardson's Skua.—Mr. N. F. Hele shewed me to-day (16th) a fine adult male of this species, which he shot a few weeks ago as it was hovering over the water near to Aldeburgh.

Twites.—Have been more numerous than usual this winter near the coast.

Snow Bunting.—On the morning of the 19th I shot one of these birds, close to the sea; another on the 22nd, and a pair on the 23rd; but these were the earliest birds that were known to have arrived.

Goldeneye.—One has been seen in Thorpe "meer," near Aldeburgh, for several days since the 21st instant.

Ring Ouzel.—In the early part of the present month Mr. T. E.

Gunn, of Norwich, wrote me word that a pied variety of this bird was killed a short time ago in this county; and he stated also that pied flycatchers have also occurred in Suffolk.

Shorteared Owl.—Two were shot near Aldeburgh on the 22nd: since then several others have been seen.

Common Scoter.—A flock of fifteen of these ducks passed close in shore, near Aldeburgh, on the 21st; and I had a long shot at one out of five in the river upon the 28th.

Shieldrake.—27th. A young bird of the year was shot by a fisherman in Thorpe Marsh this morning, and another seen.

NOVEMBER.

Brambling.—I saw the first and only brambling this winter on the 6th instant: it was sitting in a bramble hedge as I passed down a lane.

Black Redstart.—On the 15th I saw a hen of this rare species sitting on a rail in a garden at Darsham: there was no doubt as to the species.

Goldeneye.—On the 13th a friend shot an immature male in the river near Iken, out of a flock of eight young birds; and upon the 17th I reduced the number to six by procuring another. I had often watched this flock, and, by means of an opera-glass, found by repeated daily observations from behind the river bank that they dived continually, but were *never* all under water at the same time, always leaving one bird to keep watch for the others; after a short while (generally about fifty-five seconds) this bird would be relieved by another, who would give the next duck a peck to remind him when it was his turn to take the duty of sentinel.

Yellow Bunting.—18th. A fortnight ago a perfect albino of this species was shot by the head keeper in Glemham Park, but unfortunately was thrown away without being shown to me. [Query, was the keeper competent to determine the species of this albino.—ED.]

House Sparrow.—An albino sparrow was shot during the early part of this month at Woodbridge.

Crossbill.—19th. Several of these birds were lately shot near Melton, Rendlesham and Aldeburgh: some young birds, too, were killed near Thorpe.

Gray Phalarope.—On the 20th one of these rare birds was washed ashore near the Aldeburgh life-boat home, and was picked up by the coastguard.

Common Stork.—A common stork was washed up by the tide near the same place about the 15th, but the man who found it did not know its value, and by the time he had discovered that it was a rare species it was in a state of decomposition.

Knot.—One was shot on the 14th or 15th on the river near Melton.

Redbreasted Merganser.—A male of this species was shot by a punt-gunner, near Woodbridge, on the 20th: this is by no means a common species here, even in the severest weather.

Black Redstart.—On Wednesday, the 25th, as I was returning by the river bank from Orford to Aldeburgh, I shot a male black redstart: it was in excellent plumage, and weighed exactly one ounce. Before killing, I watched it for several minutes: its flight was irregular, the tail being moved quickly from side to side as it flew, and the bird uttered a short note, something like that of the pied wagtail. It never flew for any long distance, generally about thirty yards, and always alighted on the mud by the edge of the water in a small ditch; once it perched on a plank of wood, and commenced running quickly backwards and forwards.

DECEMBER.

Albino Skylark.—I paid a visit to the Woodbridge birdstuffer early in December, and was shown a white skylark, which he has kept in captivity since the spring, when it was captured in a net near Melton: it sings beautifully and is very tame, coming directly to its master's call.*

Brent Goose.—A pair of these geese were observed to fly up the river near Snape, and alight in a pea field, one day towards the end of this month, but they were too wild to allow a near approach.

Whitetailed Eagle.—On the 20th, my friend Dr. C. R. Bree, of Colchester, received one of these rare eagles from Lord Henniker, from Thornham, where it was caught in a trap baited with a rabbit for grey crows.†

Wild Fowl.—A fair number of mallard, teal, widgeon, goldeneye, tufted duck, with a few shieldrake, have appeared in the Alde and Deben; but no rare species, so far as I am aware, have occurred, except one gadwall, which was shot in the beginning of the month.

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* Recorded in 'Zoologist' for March, S.S., p. 1699.

† Id. for February, S.S., p. 1558.

Greater Spotted Woodpecker.—Four were killed near Woodbridge early in the month, and two common crossbills.

Parrot Crossbill.—I am informed that a male of this species was shot at Melton lately, but I have not yet seen it.

Goshawk.—One was shot near Bultey on the 24th of last month, and another at Rendlesham early in the present month: a third was procured near Trimley a short time since, but I do not know the precise date.

Longtailed Duck.—Two immature females were shot on the Woodbridge river at the beginning of the month.

ALEXANDER CLARK-KENNEDY.

Little Glemham, Wickham Market,
January, 1869.

About Shells. By CHARLES WRIGHT.*

IN the course of my herborizations in Cuba, I have had frequent occasion to climb trees for flowers which I could not otherwise obtain, and much more frequent occasion to clamber about the limestone cliffs which furnish a great variety of plants, many of which are common in such localities, and are found nowhere else. In these circumstances, it was hardly possible that my attention should not be drawn to the shells, some inhabiting trees, and many more the rocks. I came, in truth, to be very fond of them, spending many hours entirely devoted to shell hunting, which, I begin to think, I could have spent more profitably in my legitimate calling. I propose to relate some of my observations, and to give my views as to the causes of some of the phenomena observed, hoping that they who make this branch of the animal kingdom a special study, may be prompted to investigate these phenomena more minutely than I had time or ability to do.

Shells have a season of hybernation in hot climates as well as in cold; but, in the former, the cause of their inactivity is dryness; in the latter, low temperature. If the drought be protracted, the greater part seek a retreat where some degree of moisture prevails; for example, in the ground or among the dead leaves covering it; in a hollow tree or in the crevices of the bark; under stones or among the leaves of epiphitic Tillandsias. But occasionally an individual is found abroad at this season, and repeated examination led me to discover *a* reason for it; whether it is *the* reason, may remain for wiser ones to determine. These shells are commonly stuck fast where they are found, or glued as it were, and not merely adhering as in a time of rest in the wet season. And they have all been injured,—the shell more or less broken. Are they going to die? Are they undergoing repairs? This last seemed to me more probable. They *are* always, in part at least, grown together, not quite symmetrically often, but generally quite firmly. Do they eat by night as in the rainy season? This I cannot assert. The firmness of their attachment would indicate that they do not. So uniform has been my experience in this case, that now, if I see an Achatina, or a large Helicina, on a tree in the dry season, however inviting they may appear at a distance, I pass them by as worthless.

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* From the 'American Naturalist,' February, 1869.

Oleacina and its allies are carnivorous snails. They have a smooth polished delicate shell, yet possess the power to capture and devour others many times larger than themselves, besides being protected by a firm shell, and with a closely fitting hard operculum. Not unfrequently we find large shells like Helicina regina, or H. sagræana, quietly submitting to be devoured by an Oleacina, which it has the strength to walk off with, as easily as a tortoise could carry away a mouse. Wherein lies their great strength? I can offer a suggestion. I have often been in such situations on the face of a vertical cliff, that I needed both hands for support. At such times, if a shell attracted my attention, I used to put it between my lips till I reached a place where both hands were free. Thus I learned that the watery or slimy secretion which all these animals emit, in the case of this group, is bitter, and in the larger species very decidedly so. I can hardly doubt that the secret of the power which these snails possess is to be sought here. May not this bitterness produce a benumbing effect on their prey? I have discovered a like bitterness in no other shell, and I have collected many species in this way, using my mouth as a temporary box.

Proserpina has a shell of like delicate structure as that of Oleacina. Once I found one in close contact with a Melaniella. This, together with its structure, led me to suspect that it, too, is carnivorous. Who knows? Will an examination of the tongue tell? Will some one try it? I once amused myself capsizing these little fellows, and if they did not manifest real anger, there was a very good imitation of it. Turned on its back, it lashed its tail about violently for a snail; or, I might say, it behaved mulishly and kicked,—the organ thus forcibly used being called the foot, I believe. The inverted position seemed a painful or disagreeable one.

I hesitate to record an observation repeatedly made on account of the apparent improbability of the fact, and the difficulty of explaining it. Individuals of some species of shells many times vary greatly in size as well as in colour. In other species, the said variations are slight. In one or more species of Cyclostoma of this latter kind, I have often found young individuals considerably larger than any fully grown. There could be no shadow of a doubt that these were all of the same species, and not two distinct ones living together. Among a dozen or two fully formed shells and others nearly grown, all agreeing well in size, one, perhaps two or more, incomplete individuals would occur, so much larger than all the rest, as to suggest the question,—*Why do we not find finished shells of this larger size?*

Two solutions of this question have presented themselves as possible, though neither of them is quite satisfactory. One is, that the animal has power to absorb its shell and reconstruct it of a smaller size. The other, which seems more probable, is, that these overgrown individuals are abnormal, deformed, and never come to perfection. Thus, being thin and fragile, they soon crumble and disappear. I have thought that I found proof or evidence that mollusks *have* power to absorb and reform the shell. From Melania and Paludina, which are viviparous, I used to preserve the young found in the process of cleaning the shells. Observing that they were quite blunt at the apex, and that somehow in their growth toward maturity they became sharp-pointed, I could in no other way account for this than by supposing that they absorbed the shell, and reconstructed it after a smaller pattern. I will admit, for what it is worth, the possibility of inaccuracy in my observations when comparing small things with great. Thus, a very short cone might appear blunt, while, if increased tenfold, the bluntness would be, relatively, quite little. Yet this view does not satisfy me, and I still think my first impressions were correct. Will not some one by accurate measurements settle this question?

On the beach to the eastward of Matanzas the habits of a Cyclostoma struck me as noteworthy. A hundred yards or more from the shore, the ridge formed of sand and broken shells is overgrown with various trees and bushes, which this shell ascends probably to feed on some lichen. But if the tree leaned at any considerable angle, say twenty-five or thirty degrees, no shell could be found on it. And of the bushes, too, it had its choice as to size, also. None seemed to venture up a bush, or there was no attraction for them, if it were not larger than the finger or thumb. It may very well be, that on the small bushes they found nothing to eat; but the same reason cannot be given for their refusal to ascend larger leaning ones.

It has been said above that, in winter, shells mostly lie dormant, not on account of the cold, but of the dryness. But if, at this season, a heavy shower occurs, which is not very unusual, they come out of their hiding places and appear to be feeding; not, indeed, in such numbers as during the summer, for already many are dead. Now, let a norther, which is a drying wind, spring up, and they haste away to their retreats with all possible speed. Such a shower occurred on a winter night when I was in the neighbourhood of Guane, where there are excellent rocks for shells, and many and various shells among the rocks. Early in the morning I found some specimens of Melaniella Pichardi. They were not abundant, though I saved a considerable number, and was desirous of collecting more of them, as it is by no means common. While I was at breakfast, a light norther began blowing; I made but little stay, and returned to the rocks, in hopes, though not confident, of finding more: not one was to be seen, however. Similar effects are produced by a norther on other shells. Just at night I have observed Cyclostoma salebrosum, in numbers, on rocks where, in the morning, if a norther prevailed during the night, not one could be found but by searching among the leaves at the base of the rocks. This shell, with some others,—as Cycl. rotundatum and Cycl. undatum,—have a way of letting go and rolling to the bottom of the rock if it be inclined (and they seem to prefer such), when they see the hand approaching; and this, apparently, when they have not even *one* eye open: it would seem as if they felt the approach of danger.

A group of Cyclostomas,—C. claudicans, *Poey*, C. assimile, *Gundl.*, C. tenebrosum, *Mor.*, and perhaps others,—spin a thread by which they hang from the lower side of projecting rocks. When the weather clears after a rain, numbers may be found thus at rest, particularly in the early summer, when the young abound. Whether they can haul in their line I am unable to say, but guess they cannot; for many are found with the border broken, which could hardly be so common, unless caused by a fall from some height. If in this position they fall, it must sometimes be a distance of fifty, or, it may be hundreds of feet. These are all thin, delicate shells; and the power of suspension seems as if designed for their injury or destruction.

Helix stigmatica, and its allies, live under stones or among dead leaves: they are dull in colour, and the most of them small in size. H. stigmatica is never found fairly in the daylight. Once only, if I rightly remember, I found an individual which had just turned the corner of the rock under which it lived. Why do they not come out to the light, and what do they live upon in their dark retreats? Another group, of similar habits, comprises Helix Titanica, H. pulcherrima and others. These have longitudinal lines of bristles, or rather stiff hairs, which are quite conspicuous in the young shell, but diminish, wear away, or quite disappear with age.

Shells often cease growing for a time, so far at least as relates to their calcareous covering. Their growth is interrupted during the dry season, and it may also be by an unusually dry time in summer. In banded shells, when the growth is resumed, the pattern of their markings is often, perhaps always, changed. The bands may be moved to the right or left, or be divided into two, or two may be united, or a colour may be suppressed, or a new one introduced, or any one colour may be widened or narrowed. In Helix picta, *Born.*, the variety of markings is almost innumerable. While the animal remained quiescent as a whole, why did not the several parts retain their relative positions? The colour-secreting glands must have changed in position.

The wide diffusion of some species, and the extremely limited area in which others are found, excite in the inquiring mind a desire to know the causes of this unequal distribution. Helix regina in several forms is found in the whole of the mountain range of the western part of the island. Helicina adspersa is another extensively diffused species, besides being very variable in size and markings. On the other hand, Cyclostoma foveatum has been found only in one locality, at the base of a high projecting cliff, in considerable numbers, but all dead; nor is it known where it lives. I have looked upwards from below, and have climbed to the top and looked downwards in vain. Not more than two or three have been obtained in a moribund state, —a single one only with sufficient life to enable Gundlach to describe and figure the animal. A few square yards contain all we know of this species. Achatina fasciata is found from one end of the island to the other, and at all elevations above the sea, under several forms which have been described as distinct species. Helix picta, *Born.*, is another widely diffused shell, and extremely variable in colour and size. I have observed many young in the top branches of a high tree just felled, on the very top of the mountains, in Yateras. It seems to be a high climber, which may account for its comparative rarity, fully grown and alive. I have met with very few.

Cylindrella is largely represented in Cuba, more than eighty species being enumerated in the latest catalogue. Most of the species are extremely local; several, so far as is now known, being restricted to localities of a few yards square, or to a few rods. Doubtless other localities will be discovered for many of them. A few, as C. Poeyana, C. elegans and C. irrorata, are much more widely spread, but probably not one extends through the whole island as does Achatina fasciata. But what is most noteworthy is the remarkable tenacity of life possessed by many species. Some have lived for months, and even years; and, unless closely confined, they will crawl forth on the return of warm, damp spells of weather, getting into the wrong boxes and creating sad confusion.

A Contribution towards the Life-history of Cecidomyia persicariæ, Linn. By ALBERT MÜLLER, Esq.

THE eggs of the spring generation of this midge are laid in the months of April and May by females which have hybernated in their cocoons in the larval state, in small batches of from three to ten, on the under margins of the leaves of Polygonum amphibium, *Linn.* (*var.* terrestre). They are pale orange, oblong, rounded off at both ends, and piled one against the other in a recumbent position, in a similar way to that in which we see small pebbles settled down in the beds of rapidly-flowing brooks: the larvæ hatch after a day or two, according to the weather; they are then almost transparent, and of a very pale hue; their shape elongated and depressed. As they are getting older they assume the well-known shape of nearly all Cecidomyian larvæ; the body slightly truncated behind, increases in breadth towards the middle and tapers gradually to a point; their colour is now orange, and remains so for the whole term of their larval life. At first they are rather lively when disturbed, but their rapid growth soon renders them obese and more or less helpless. Under the influence of their irritating action,* the inhabited leaf-margins gradually assume the form of rolls, curling downwards towards the midrib of the leaf, the substance of which becomes bloated, and, as the accumulation of sap increases, the irritated part turns yellow, then orange, and, in parts exposed to the sun, crimson-red.

When the larvæ are full grown, which happens a fortnight or three weeks after birth, according to the weather, (showery, warm days promoting their development greatly), they *spin* within the leaf-roll a white, opaque and rather strong silken cocoon, cigar-shaped and tapering to an obtuse point at both ends. Several of these cocoons may often be seen attached to each other longitudinally: this operation finished, the insect, after a few days outward repose, rids itself of the larval skin and appears as a sculptured pupa, the colour of which changes from a pale amber hue into the following mature condition: the length is somewhat less than half the size of the larva; the head, eyes, feeler-, palpi-, wing- and leg-cases jet-black and shining; the thorax polished dark brown; the abdomen beneath of a dirty yellow; the anal segment, viewed from above, is dark brown; the next two segments dirty yellow; the following four are all dark brown; the eighth and ninth segments dirty yellow.

After a lapse of from twelve to sixteen days (reckoning from the date of the shedding of the larval skin), the pupa, ready to emerge, by means of a very slight tooth placed on each side just above the base of the feeler-cases, cuts a lateral opening through the cocoon, at or near the spot where the coccon's upper end begins to taper off, and by a series of progressive movements wriggles itself out far enough to give the upper part of its body free play, whilst the abdominal segments remain fixed within the cocoon: the thoracical part of the pupal envelope begins to split longitudinally through efforts from within; gradually the head, with its appendages, the wings and legs, are drawn out of their separate cases, and the whole insect with a shuffling movement forward glides out, leaving the transparent pupal skin projecting from the cocoon. It is noteworthy that the feeler-cases are now standing clear of the thorax, whilst, like all other limbs, they were, during the pupal state, soldered more or less to the body. After a few minutes the imago discharges a small quantity of a milk-white fluid, and the limpness of its whole organisation compels it now to take a few hours rest, which it passes with its wings at first slightly raised and afterwards folded flat on the back. During this period the head and thorax are dark brown, the orange body gradually grows darker too, the antennæ assume their characteristic curved position, and at last the insect appears in its well-known garb, which I need not further describe. Copulation, lasting only a few minutes, takes place soon afterwards; the smaller male, easily recognizable by his antennæ being about the length of the body (whilst those of the female are only half the length of her's), seeking his more sluggish partner with vibrating wings, and as quickly leaving her again. The abdomen of the impregnated female, after a few hours' interval, swells to an enormous extent; her ovipositor now becomes visible and far protruded, and she betakes herself to the under side of the Polygonum leaf, there to deposit her eggs in the manner indicated above.

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* I believe this action to be a kind of licking, not sucking, as has been suggested.

The number of females is far greater than that of the males. The average duration of the perfect insect's life in captivity is not more than three or four days.

For the opportunity of making many of these observations I am indebted to my friend Mr. H. W. Kidd, of Godalming, who in October last sent me a quantity of the cocoons to look after during his absence from home: I immediately damped the Polygonum leaves slightly, then gradually removed the cocoons into some damp sand under a bell-glass, and what precedes is the result of this little trouble. I would, therefore, recommend to all observers who work at these Diptera to try a plan similar to my own; and if, in consequence of the suggestion I now throw out, it should fall to our lot to have to record elsewhere a good many observations by other gentlemen on the natural history of other gall gnats, I shall feel still greater pleasure than I did in carrying my own experiment to the end detailed in the present paper.

ALBERT MÜLLER.

Penge, May 1869.

Collected Observations on British Reptiles.

By EDWARD NEWMAN.

(Continued from S. S. 1665.)

Subclass 2. METAMORPHOTIC REPTILES.

No mistake can be greater, or less in accordance with the true principles of scientific arrangement, than to raise the Metamorphotic Reptiles to the rank of a class, while the desmogenous fishes, gymnogenous birds and marsupial sucklers are allowed to remain integral portions of the classes to which they respectively belong. The different mode of reproduction obtains equally in each of the four classes of endosteate animals; and whether we are classifying Sucklers, Birds, Reptiles or Fishes, we must accept it in all, or reject it in all. The great character by which the Metamorphotic Reptiles are separated from the Immutable Reptiles is, as the name implies, the presence of a complete metamorphosis; and although the full value and weight must be allowed to this important distinction, we should never forget that a precisely similar discrepancy obtains in the other classes. This distinctive law, however, is not absolute; indeed, like every other strongly marked character, it is liable to important exceptions. The salamander, for instance, produces its young alive, sometimes taking to the water with this object, but generally seeking some moist, mossy retreat, or the damp flooring of a stone crevice or cavern, where the humidity of the surrounding atmosphere and objects affords the necessary conditions: when the young are produced in an ungenial site in this respect they quickly perish. I believe this viviparous parturition of the salamander is invariable, in this respect differing from that of Lacerta agilis, in which I regard it as exceptional only. The first notice of the phenomenon that I met with was communicated to me by Mr. Samuel Gurney, so favourably known to naturalists by his successful experiments in breeding salmon, rearing black swans, &c. The following is Mr. Gurney's record made at the time.

"Whilst staying at Dresden for a few days last year, in the month of July, we took an excursion to Thorant, a picturesque little village and watering place, a few miles distant. It was a splendid evening, after a very showery morning. Whilst walking through a wood I found two salamanders, which I took back with me to Dresden, and put them in a small box which I procured for the purpose. We went out for a three days' excursion into Saxon Switzerland, leaving them on the window-sill: on our return I found one of them dead (from the box having been exposed to the heat of the sun), and the other nearly so: it, however, soon revived on being sprinkled with water, and it was our *compagnon de vogage* till our return home, where I left it for some months in a glass fish-bowl, with some mould and moss, which was kept slightly moist. My gardener used occasionally to give it a worm, though it seemed to thrive just as well without being fed. I presented it to the Zoological Gardens in January; a few days afterwards it produced some young ones, and, in the course of a week or so, it had brought forth thirty-two, most of which soon died, but six of them survived nearly a fortnight."—*Zool.* 2789.

The loss of the little ones was, doubtless, consequent on the ignorance of the keeper as to the viviparous character of parturition; and the absence of all provision for the unexpected event. Had the salamander in question been provided with water, or thoroughly wetted moss, in all probability her little ones would have survived. Great doubts have been expressed as to this exception of the salamanders being a solitary one, and instances have been reported of toads proving viviparous in cellars where access to water was impossible; but these reports, as far I have been able to investigate them, turn out to be unsatisfactory: in some instances the reporters are anonymous; in others pseudonymous; in others, where a real name and address has been given, access to the writers has been found difficult; and finally, in those cases where the reporter has been found trustworthy, the conditions have not been scrutinised with that care which such statements require. In one particular instance, in which there could be no doubt as to the good faith of the reporter, the marvel, for such it was deemed, was diminished very considerably by two collateral circumstances:—*first*, it was exactly at the time of year when the ordinary migration of minute toads commonly takes place; and, *secondly*, access to the cellar was very easy, and almost inevitable, by means of some steep stone steps leading from a large and unwalled garden, an arrangement which would render the descent to this *Avernus* remarkably *facilis* for the juvenile travellers, should any be passing in that direction, and after the first tumble their fate would be sealed, for *revocare gradum*, that is to reascend the steps, *hic labor hoc opus est*—would indeed have been a task all but impossible.

All the Metamorphotic Reptiles shed their skins once at least in the year, some of them oftener, and all without exception swallow their cast-off clothing I wish to lay stress on this last named fact, inasmuch as the detailed descriptions of the process given by various authors in regard to the toad, without mentioning natterjacks, frogs, salamanders or newts, would, I think, fairly lead to the inference that the phenomenon was peculiar to the toad. This is by no means the case, and our not regarding this propensity as general and characteristic of the subclass arises simply from the lack of observations, not from the absence of the character. The most graphic description of this ecdysis in the toad is from the pen of Mr. William Turner: I transcribe it entire.

"I have a small house under my care for growing cucumbers; there is a bed in the middle of it, and the soil is about three feet high from the ground (*i. e.* to the top of the hills where the plants are in); a person, therefore, standing in the house can examine an object placed on the hill with ease. Last Saturday, about seven o'clock, a.m., I uncovered the house and went in to see that all was right, when, to my surprise, I saw my pet companion, a fine toad, apparently in the agonies of death. It was seated at the end of the hill of soil; its mouth, or rather under jaw, opened every few seconds (the top jaw did not move), the eyes shut, and the body violently convulsed each time the jaw opened; and with each convulsion of the body the right fore foot was raised to the head: I placed myself in front of it, and perceived it was drawing something into its mouth each time the jaw moved; at that instant the right eye opened; it then inflated the body on the left side and drew in the right, placing at the same time the left fore-foot on the head behind the eye, and drawing it down to the mouth; it next appeared to hold its foot in its mouth for about a second, which it then drew out, and I distinctly saw the three points of skin that came off its toes outside its lips, till the next opening of the jaw, when they were drawn into the mouth. When it drew its foot over its left eye (which before was shut) it broke out as bright as ever. Some folds of the skin adhered to the left leg, but by two or three motions of the jaw they were gone, and in about a minute the skin was drawn off the lips: the toad had eaten its own skin, and there it stood with its new covering as bright as if it had been fresh varnished. I endeavoured to touch it to feel if it was clammy, but the creature gave a vigorous jump and the soil adhered to its legs: I looked at it an hour afterwards, but it had begun to assume its dingy brown colour. The time it took to get off its head-dress was only a few minutes: it appeared to me that each time its jaw opened, it drew the skin forward, while it distended the body on the side to be uncovered."—*Zool.* 2855.

Mr. Bell, in a communication made to the Zoological Club of the Linnean Society, and also in his 'British Reptiles,' not only gives a very similar account, but adds such interesting particulars that I need make no apology for extracting the narrative:—

"Having often found, amongst several toads which I was then keeping for the purpose of observing their habits, some of brighter colours than usual, and with the surface moist and very smooth, I had supposed that this appearance might have depended upon the state of the animal's health, or the influence of some peculiarity in one or other of its functions: on watching carefully, however, I one day observed a large one, the skin of which was particularly dry and dull in its colours, with a bright streak down the mesial line of the back: and on examining further I discovered a corresponding line along the belly: this proved to arise from an entire slit in the old cuticle, which exposed to view the new and brighter skin underneath. Finding, therefore, what was about to happen, I watched the whole detail of this curious process. I soon observed that the two halves of the skin, thus completely divided, continued to recede further and further from the centre, and become folded and rugose; and after a short space, by means of the continued twitching of the animal's body, it was brought down in folds on the sides. The hinder leg, first on one side and then on the other, was brought forward under the arm, which was pressed down upon it: and on the hinder limb being withdrawn, its cuticle was left inverted under the arm, and that of the anterior extremity was now loosened, and at length drawn off by the assistance of the mouth. The whole cuticle was thus detached, and was now pushed by the two hands into the mouth in a little ball, and swallowed at a single gulp."—*Bell's 'British Reptiles,'* p. 120 of the Second Edition.

This phenomenon has also been observed, as before stated, in the natterjack, frog, salamander, and both the common species of newt, so that we must conclude it is a law throughout the Metamorphotic Reptiles.

A third and most interesting distinction between the Immutable and Metamorphotic Reptiles is to be found in the existence of a highly poisonous viscid fluid which exudes through pores in the skin: this fluid is secreted by follicular glands seated under the skin almost over the whole of the dorsal area, and is emitted at the will of the animal; but whether from fear or anger it is impossible to say. I find some very imperfect observations on the properties of this secretion in the 'Philosophical Transactions' for 1826, by Dr. John Davy, who concludes that it is innocuous: this assumption, however, is erroneous. The earliest tangible experiments with this poison were made by two French philosophers, Gratiolet and S. Cloez, who by inoculating various animals with the cutaneous fluid of toads and salamanders, have demonstrated that it is endowed with well-marked and exceedingly dangerous qualities. The first experiment of these gentlemen was performed on a little African tortoise, which was inoculated with some of the toad poison in one of its hinder feet: paralysis of the limb supervened, and still existed at the expiration of eight months, thus demonstrating the possibility of local poisoning by this agent. In order to determine whether the poisonous material was deteriorated by keeping, the two gentlemen procured about twenty-nine grains of the poison on the 25th of April, 1851, and having laid it aside until the 16th of March, 1852, they inoculated a goldfinch with a small portion: the bird almost immediately died. Subsequently the investigators succeeded in eliminating the poisonous principle from the inert matters with which it is associated in the skin pustules, and they found that when thus purified its effects were much more intense. Linnets were subjected to its influence and died in about six minutes after inoculation; they were not convulsed, but opened their beaks, and staggered as if inebriated; they soon closed their eyes, and finally fell down dead. Subsequently the experimentalists inoculated a dog and a goat with the poison, and found that it caused death in less than an hour. M. Vulpian performed similar experiments with the poison of the toad and natterjack, on dogs and guinea-pigs, and found that they died in periods varying from an hour to an hour and a half. The poison is also effective on frogs, killing them within an hour, and acting equally well by merely applying it to the surface without puncturing the skin of the frog; but on toads themselves it has never been observed to have any effect whatever. One instance has been recorded of its fatal effect on a human being, and this so interesting and so important that I shall quote it here. "A young lad, ten years of age, named Louis P——, whose parents are small tradespeople in the Faubourg Saint-Antoine, at Paris, was playing with some of his companions near Bercy, not far from a building in the course of demolition. This boy, who was of a delicate constitution, had a slight abrasion on the skin of the right hand: having seen a lizard run into a hole in an old wall, he put in his hand, but instead of the lizard he drew out an enormous toad, which he immediately threw on the ground. The skin of the toad is covered with large tubercles formed by an aggregation of small pustules open at their summit: a milky liquid, of a yellowish-white colour, very thick and of a fetid odour, escapes from these tubercles when the animal is irritated. Whilst the lad had the animal in his hand, this liquid, which is a virulent poison, was introduced through the wound in his hand into the blood: he was soon after seized with vertigo, vomitings and faintings, and was carried to the house of his parents, who called in a doctor immediately; but already the malady had made such progress, that in spite of the most energetic means employed, the patient soon died." These experiments are recorded in an English dress in the 'Zoologist' for 1852, at p. 3658, or in Mr. Cooke's work on 'Our British Reptiles,' p. 116: they prove in a most satisfactory manner that Metamorphotic Reptiles secrete a virulent poison, and experience shows us that an instinctive knowledge of its existence is protective to the animals themselves, since cats almost invariably avoid contact with frogs, toads or newts, and dogs absolutely refuse to attack them; and if pertinaciously incited to worry a frog or toad, a dog will be observed to froth at the mouth and exhibit every symptom of abhorrence and disgust. In this there is something very remarkable and worthy of admiration, for, of all created beings, the Metamorphotic Reptiles are the most innocuous and defenceless; and were they not protected by the innate knowledge possessed by carnivorous animals of this poisonous property, they must inevitably perish, and thus a useful race of insectivorous animals would be utterly exterminated. Like most of the known strong organic poisons, the active principle of toad venom is alkaline in its character, almost insoluble in water, slightly soluble in ether, and very soluble in alcohol. My correspondent, Professor Moquin Tandon, in his 'Medical Zoology,' describes this secretion as "a thick viscid milky fluid with a slight yellow tint and poisonous odour,"—the latter expression I do not fully appreciate,—and adds that "it has a disagreeable caustic bitter taste: it becomes solid on exposure to air, and assumes the form of scales when placed on glass."

In the arrangement of memoranda, which have been many years in the course of collection, it would have been satisfactory to have followed some safe guide as to the classification of the species, but there is none. Even so lately as in the January number of this periodical it was shown that one of the principal orders in our artificial methods is composed of the larvæ of species belonging to a totally different group (see Zool. S. S., p. 1569), a discovery which, while it destroys our received conclusions, opens up a world of conjectures: it shows us that such genera as Siredon, for instance, consist of larvæ which have the power of propagating their kind, and thus that an unascertained number of generations may pass away before a single individual has arrived at perfection! What, then, is the test of maturity? We are, as it were, still on the very threshold of knowledge as regards these creatures, and they may possibly pass away before we have entered even the vestibule of the temple.

It is clear that the Metamorphotic Reptiles exactly correspond with the Batrachians of Cuvier, and his divisions Les Grenouilles (*Rana*) and Les Salamandres (*Salamandra*) must be accepted under the names of Ranidæ or Frogs and Toads, and Salamandridæ or Newts. They are distinguished by the simple and very convenient character of possessing or not possessing a tail in the perfect state.

Order I. or Family I. FROGS and TOADS (RANIDÆ).

Have no tail when arrived at maturity.

Genus BUFO.

Skin dry, warty: no teeth, either palatal or maxillary.

THE NATTERJACK (*Bufo viridis*).

Natterjack Toad, Goldenback, Walking Toad, Mephitic Toad.

Bufo viridis, *Dumeril* and *Bibron*, vol. viii., p. 681; *Clermont, Quadrupeds and Reptiles of Europe*, p. 253.

Bufo variabilis, *Schinz*, *Europ. Faun.*, vol. ii., p. 74.

Bufo Calamita, *Jenyns, Brit. Vert.*, p. 302. *Bell*, *British Reptiles*, p. 126.

Bufo viridis, *Buon. Faun. Ital.*, and Bufo Calamita, *Buon. Faun. Ital.*, figured as two distinct species.

A word as to the name. In the 'Penny Cyclopedia,' article "Toad," there is the following note on this subject:—"Bufo Calamita, *Laur*, recorded as a distinct species by the Prince of Canino ("Fauna Italica" and "Amphibia Europea"), is considered by MM. Dumeril and Bibron as identical with Bufo viridis." My friend Mr. W. R. Tate writes me thus:—"I think Bufo viridis is only a variety of Bufo Calamita: I possessed a German specimen some time ago, and it differed only from the Natterjack in being of a more decidedly green colour, and in having the dorsal stripe very faint. In the number of toes, formation and mode of progression it was identical with B. Calamita, and it emitted the same sulphurous scent when handled." Two varieties are of frequent occurrence on Blackheath,—one of them decidedly greener than the other,—but I cannot accept them as species, although I believe there is no other distinction between the Prince of Canino's species. I adopt Dumeril and Bibron's name in deference to their high authority, but am not satisfied which of the names, "viridis" or "Calamita," has the claim of priority.

The Natterjack has no teeth, either palatal or maxillary: the tongue is rounded at the tip: the eyes are prominent and brilliant: the skin is dry and covered with depressed warts, which are coarse and irregular on the back, finer and more uniform on the belly: the male has a vocal bladder on each side of the neck, invisible except in the act of croaking, but there is a protuberance behind the eye that possibly has some connection with this vocal apparatus; the legs are short; the fore feet, each of which has four toes, are turned inwards; the third toe is longer than the rest, the others are nearly equal in length; the hind legs are longer than the fore legs, but are not formed for leaping; they have five toes, of which the fourth is decidedly the longest, and the third next; the first and second are nearly equal; the toes are connected, at the base only, by a membrane. The colour is either olive-brown approaching to green, or ochreous-brown, the warts and a somewhat triangular patch behind the eye being brick-red; the belly is whitish or yellowish, and is generally spotted with dull black: the under side of the hind thighs is also pale, and indistinctly barred with black. The contrast between the colour of the back and belly is very marked, and the paler colour of the belly often ascends the sides, but without much regularity.

The food of the Natterjack consists entirely of living creatures: but little care is displayed in the selection of these—woodlice, bees, beetles, flies, moths, caterpillars, slugs and worms, seem equally acceptable: the only required condition I have observed is that the food must be living. I have repeatedly but vainly tried to tempt the Natterjack in confinement with a plump and smooth caterpillar as green as grass, previously killed with hot water; but all to no purpose; yet he would always most willingly take a buzzing fly from between my finger and thumb. The mode of feeding on a small object is by touching it with the tongue, to which it seems to adhere and to be drawn into the mouth immediately, but a worm is seized by the middle- and in spite of every effort to escape is eventually swallowed.

The Natterjack breeds late in the spring, or indeed when spring is almost turning into summer; I have repeatedly found them in the water depositing their spawn as late as the 15th of May: the eggs are small, blackish, and connected together in a double series by a glutinous thread, like beads on a couple of parallel strings: in no instance have I found masses of spawn like those deposited by the frog, and with which we are so familiar. I have always found the breeding places of the Natterjack to be shallow pools on open sandy heaths; indeed, they seem to prefer to have the water so shallow that they can keep the mouth and nose exposed while they are still resting on the bottom. Having discovered such a resort, I have always fished it with my water-beetle net, and after the water has drained off I have found the double-beaded strings of Natterjack spawn crossing in all directions the cheesecloth of which the net is made. In warm weather the eggs are hatched in a few days, and the tadpoles retain that state for many weeks: in 1848 I possessed tadpoles of the Natterjack still unchanged on the 12th of October, as stated in the 'Zoologist' (Zool. 2305). I made a series of drawings of the tadpoles in all their stages, but these present no material difference from those of the toad, or even of the frog, except in their less size and darker colour. They appear to feed entirely on decomposing matter, and I have no doubt that, in conjunction with the tadpoles of frogs and toads, they act beneficially as scavengers and purifyers, devouring all decaying substances that may chance to come in their way. I have seen them congregated by thousands about the carcase of a drowned dog, and on one occasion I obtained about half a pint of these little creatures from such a situation with one sweep of the net. Their metamorphosis usually takes place about the beginning of September, and the young Natterjacks are excessively small, but in no period of their final state, however small they may be, is there any difficulty in recognising the mediodorsal stripe which serves as their distinctive characteristic: as soon as their transformation is complete they leave the water for a time, but remain on the very brink, forming a living belt round the sinuous margin: immediately on being disturbed they scuttle back into the water, diving at once to the bottom, and remaining out of sight until the supposed danger has passed. Whatever the danger, however pressing the emergency, and whatever his stature, the Natterjack never demeans himself by adopting the hopping mode of progression so derogatory to dignity in the common toad. The baby Natterjacks remain round the margins of their native pools for a month or more, only returning to the water on occasions, and during this period they seem to have very little opportunity of tasting food. At this period the amphibious character of Metamorphotic Reptiles is fully exhibited, for, whilst their babyhood lasts, an exposure to the air seems necessary for maturing the newly acquired organs of aerial respiration, and a frequent dip in the water equally essential to prevent the too rapid absorption of the old organs. The period of probation lasts about fourteen days, and after it has expired the first soaking shower is the signal for migration; they then leave the scene of their babyhood and scatter themselves in all directions. A perilous period is this with every species of frog or toad. Birds, lizards, mice and rats seem to regard these migrations as a provision for their welfare—a kind of manna falling in the wilderness for their especial benefit, and without waiting for invitation they hasten to the welcome feast.

On the approach of winter the little Natterjacks secrete themselves under stones or stacks of turf, and pass the colder months in abstemious sleep; but no sooner has the sun regained some power than the little fellows again seek the water, and remain in its vicinity so long as summer lasts, always seeming to regard water as a haven of refuge and hastening into it on the apprehension of danger.

Until the arrival of autumn, the Natterjacks, being then twelve months old, continue to be strictly diurnal animals, delighting to bask in the sun and indulging in constant diurnal ablutions, but on arriving at their full growth they become nocturnal, remaining concealed in subterranean galleries by day and venturing abroad only by night; still their taste for bathing continues. M. Julian Deby tells us, in the 'Zoologist,' that during their nocturnal rambles in search of the wandering members of the invertebrate world, they habitually indulge in a cold bath, and while enjoying this luxury they croak incessantly, "making night horrible." I have often heard this nocturnal serenade, but never detected the musicians: my friend Mr. Tate has been more fortunate: he says, "After dark, or at least after the rising of the moon, I was returning home across Wisley Heath, and, when near a pond, something ran quickly across the path. I took it up and saw by its bright vertebral stripe, showing clearly in the moonlight, that it was a Natterjack. I therefore commenced looking round the pond, and caught no less than fifty-seven of them. The noise they were making was very great; their croak being hoarse and one continued note, instead of, as in the common toad and frog, a succession of short notes. The Natterjacks showed more sense than the toads, by leaving off croaking and squatting close to the ground to escape observation whenever I approached one of their haunts, while the toads kept croaking and hopping. I found them always in shallow water in which they can sit with their heads out, and, as their name (calamita) implies, among reeds very often. I see now why their eyes are so much brighter by night than by day, as they are evidently nocturnal in their habits; but until this time I had always caught them on hot, sunny days going about the heath in pairs."—'*Science Gossip*,' i. 111.

I scarcely agree with my friend in his conclusion that their bright eyes indicate nocturnal habits, or indeed that the species is nocturnal at all until perfectly mature; for the first year of its existence it is most decidedly a lover of the sunshine.

The peculiar scent of the Natterjack has been observed by all naturalists: Shaw calls it mephitic; Lord Clermont speaks of it as a strong sulphury odour; Roesel says the smell resembles that of orpiment or arsenic in a state of evaporation; this author also connects this smell with the poisonous exudation, and tells us that it can eject the fluid to a distance of three or four feet, and that if the poison fall on any part of a room where the creature is kept the scent will be perceived for two months afterwards. These statements I have never verified.

The appearance of a Natterjack when at rest is almost exactly similar to that of a toad; the only striking difference is in the presence of the mediodorsal stripe, but no sooner does the creature commence action than a manifest discrepancy is observable: the toad progresses by a series of short and apparently laborious jumps, at each descent falling flat on its belly; the Natterjack's mode of progression resembles that of a huge spider, being a rapid run, and the belly being kept clear of the ground: in this run it continually stops, also like a spider, as if to rest. I have never seen the creature make the slightest attempt to jump. I have paid great attention to these interesting animals ever since the year 1826, when I first observed them on Blackheath: in 1841 I brought some from that locality to my little garden at Peckham, where they soon established themselves in subterranean galleries, which they occupied for many years; every night they made predacious excursions, and were frequently detected wending their way home some hours after daylight, when they were very apt to be picked up and handled by the children, into whom no wholesome fear of fire and poison-spitting on the part of frogs and toads had ever been instilled: it is certainly an unwonted sight to see a little girl of two years of age taking up a huge toad or a natterjack, and fondling him as a very nice playfellow.

The Natterjack is common on the Continent of Europe, in Germany, Poland, the South of France, Switzerland and Russia, and Lord Clermont adds the West of Asia and the North of Africa. In England it occurs at Gamlingay in Cambridgeshire, King's Lynn in Norfolk, Wisley Heath, Putney Heath, Wimbledon Common, and many other localities in Surrey, Blackheath in Kent, and probably in other counties; in Scotland it has been found abundant on the coasts of Solway Firth; and in Ireland it is equally abundant on the southern slopes of Macgillicuddy's Reeks, in the Killarney district. I supposed this a discovery of my own in 1839, but found from the late Dr. Mackay that he had published the fact three years previously in the 'Magazine of Natural History.'

Mr. Cooke records a superstitious belief at King's Lynn, in Norfolk, respecting the Natterjack. "One of these toads is to be obtained and buried in an ant's nest, where it is to be left for some time. When the flesh is all cleared off by the ants, and the skeleton is quite clean, the shoulder bones are to be taken off and thrown into a running stream. One of these bones will float with the current, whilst the other will float against it. The latter bone must be secured, and, if kept as a talisman, will confer on its possessor supernatural power."

EDWARD NEWMAN.

(To be continued.)

Otter in Suffolk.—A fine otter was shot on the 5th March, in the vicinity of Oulton Broad, whilst basking on the stump of an old tree.—*T. E. Gunn, Norwich.*

Mouse or Spider.—In this month's number of your 'British Moths,' when noticing C. Perspicillaris, you say—"There are two records of this moth in England—one at Yarmouth, and the second (a wing only) at Ashford, in Kent: the latter is said to have been found in a spider's web." This reminds me of the old controversy, Spider or Mouse, and adds another spoke in the wheel in favour of my opinions in that controversy; and I firmly believe that two men were never more mistaken than Messrs. Doubleday and Newman in that matter. I feel that I am but a minnow attacking tritons, but you must recollect that neither of you ever attempted to overcome the difficulty of bats feeding on butterflies: the fact alone of almost all the wings found at Looe being butterflies, convinces me that bats had nothing to do with the matter.—*Stephen Clogg.*

Musk Rat (Sorex cærulescens) *and Frog.*—At Jaunpùr, N. W. Province, India, on the 22nd October, 1861, I was coming out of my room at 4 a.m., when I heard a cry of distress outside; it sounded something like the noise made by a frog when in pain. It was still dark, so, taking a hand-candlestick, I went to the grass whence the sound proceeded: here I found a frog making feeble attempts at escape, hopping and crawling short distances, and every time he stopped a musk-rat rushed at him and gave him a bite, on which he cried out; he was evidently getting weaker and weaker. Undeterred by my presence, this went on till they reached my bath-room door, when the musk rat, seeing me, made a bolt into a small drain, and so escaped me. I examined the frog, and found that he had been bitten in many places and was very weak: had I not come, the musk rat would undoubtedly have made a feast on him. Again, as to the insect-feeding of the musk rat. On the evening of June 28th, 1861, as we were sitting in our drawing-room at Jaunpùr, we had placed the large lamp on a small round table nearly in the corner of the room, away from us, on account of the swarms of insects which were attracted by the light. These insects, at least many of them, fell to the ground against the corner wall, and as I was watching them for specimens, a fine musk rat appeared, and amused himself and us by catching them and eating them: he stood on his hind legs to reach up the wall, which the grasshopper and other insects were endeavouring to climb up, and even jumped at them every now and then. This scene was repeated several nights. I believe the reason that musk rats are so fond of frequenting bath-rooms is on account of the frogs often found there, and the foregoing incident confirms the idea; although, as a rule, this animal may be held to be an insect feeder.—*C. Horne, B. C. S.*

Ornithological Notes from South Devon. Little Gull.—One of these birds was caught in Torbay on the 14th of January. Another was shot in the same locality a few weeks later. Both these birds were brought to Mr. Shopland, the naturalist, in Tor (Torquay), in the flesh to be stuffed, where I saw the one first named.

Pintailed Duck.—These ducks have been very numerous this winter, and especially in January, in the neighbourhood of Torquay.

Early Nesting of the Robin.—A robin's nest was found on the 7th of January, in Smale's Nursery Garden, Torquay.

Variety of the Sparrow.—In the beginning of January I saw, near the Torquay Harbour, a male sparrow with the primaries of a pure white.

Common Scoter.—On the 17th of February two of these birds were shot in Torbay.

Cream-coloured variety of Chaffinch.—In the early part of February a chaffinch, entirely cream-coloured, with the usual white bands on the wings, was brought to Mr. Shopland, the naturalist in Tor, to be stuffed, where I had an opportunity of seeing it.

Cinereous Shearwater.—One of these fine birds was shot near Berry Head in February. The bird swam up to the boat so daringly that it had to be driven off some yards, in order that in shooting the bird it might not be blown to pieces.

Mountain Finches.—A pair of these beautiful finches was shot in the neighbourhood of Paignton in February. They are of rare occurrence in South Devon.

Gannets and Redthroated Divers.—These birds were shot in considerable numbers this winter in Torbay. Mr. Shopland had no less than fifteen gannets for stuffing at one time.

Abundance of Goldcrests and Wrens.—Great numbers of these birds have been observed in this neighbourhood.

Early Nesting of the Missel Thrush.—A nest containing four eggs was discovered near Torquay on the 6th of March.

Swallows.—Swallows were observed in this town for the first time on the 10th of April.

Cuckoo.—This bird was first heard on the 11th of April.

Early Singing of Warblers.—The chiffchaff, willow warbler, blackcap and tree pipit were heard singing on the 11th of April.—*A. de Hügel; Florian, Torquay, April* 17, 1869.

Osprey in Norfolk.—A fine bird (probably a male) was shot near one of the broads in this county last September.—*T. E. Gunn; Norwich.*

Early nesting of the Barn Owl in Norfolk.—An unusual instance of the early nesting of the barn owl has recently come under my notice. On the 26th of February a nest of two fresh-laid eggs was taken from an old ash tree at Ketteringham, by a lad, who also caught the old bird whilst sitting.—*Id.*

Ring Ousel at Muswell Hill.—On the 10th of April a man in this neighbourhood shot a specimen of the ring ousel; it was in company with the male bird: they were both feeding on some grass-land between Highgate and Muswell Hill: both birds were seen two days before, and the male continued near the spot until the 12th of April. Not having heard of the occurrence of this bird so near London before, I have taken the liberty of sending you this short notice.—*Walter Smith; North Lodge, Muswell Hill*, 13*th April*, 1869.

Cirl Buntings and Crossbills in Devonshire.—In March I received for preservation a beautiful pair of cirl buntings, male and female: they were shot during the earlier part of the month at Knightsbridge, in Devonshire. I also received information of the capture of several crossbills about the same time, in the same neighbourhood.—*T. E. Gunn; Norwich.*

Crossbills in Surrey.—During the middle of February a flock of crossbills, consisting of one male and six females, were seen on some firs at Foxwarren, near Cobham, some of which were killed and sent me for preservation.—*Id.*

Name of a Finch.—I shall be much obliged if you will be so good as enlighten me as to the species of the bird of which the following is a description: it was shot yesterday near a farmhouse at Mayfield, having been observed in the garden for a day or two previous feeding on groundsel. The bill indicates that it belongs to the bunting family: the length of the bird, from the tip of the bill to the tip of the tail, is five inches and three lines; forehead, crown, cheeks and throat, bright ultra-marine; space between the bill and the eye black; back, tail coverts, breast and under parts, bright greenish blue, changing in different lights, of precisely the same tints and varying hue as the tail-coverts of the common kingfisher; primaries brown; the outer web of the fourth white; the outer web of the greater wing-coverts blue; the inner, which is seen but little when the wings are closed, black; tail dark brown, the outer edge of the central feathers tinged with blue. The bird was in very good condition: I have preserved it.—*H. T. Murdoch Kirby; Mayfield Rectory, Hurst Green, Sussex, April* 14, 1869.

[As well as I can make out the description, I think the bird is the "Nonpareil Finch," a native of parts of South America: they are frequently brought to this country, and live very well in the aviaries of the "Zoo." I know of no other species that answer in any way your query. There can be no doubt that the bird is an escaped specimen.—*F. Bond to E. Newman.*]

Hoopoes at the Land's End District.—I have seen no less than four of these beautiful birds in the flesh during the last week. It is much to be regretted that every example of this beautiful bird should be persecuted to death whenever they appear, especially as the occurrence of more or less every spring may be regarded as a certainty.—*Edward Hearle Rodd; Penzance, April* 20, 1869.

Cuckoo in Confinement.—A cuckoo, caught last June or July, whilst being fed by a pair of yellow wagtails, has been kept caged through the winter: I saw it this morning alive and well; it sometimes indulges in a sort of laugh, somewhat like that of a parrot, but has never yet cuckoo'd.—*Egbert D. Hamel, Bole Hall, Tamworth, April* 15, 1869.

Curious Malformed Beaks of the Woodpigeon and Ringed Plover.—On the 18th of February a female woodpigeon was shot at Rackheath, near Norwich, which presented an unusual growth of bill in both mandibles. The upper mandible was at least three quarters of an inch longer than the lower one, and gradually arched throughout its length. A few days since I received some ringed plovers from Yarmouth: the upper mandible of the bill of one projected beyond the tip of the lower to some extent.—*T. E. Gunn; Norwich, March,* 1869.

Vitality of a Turkey.—The Norwich papers of the 6th of February last contained an account of a turkey that had remained for thirty-eight or forty days without food. A game dealer of this city had some turkeys which were placed for the night in a cellar that was a sort of general receptacle; next morning the birds were taken out, with the exception of one that had imprisoned itself behind a couple of barrels: this when discovered was still alive, although in a very emaciated condition; it died two days afterwards, partly, it is supposed, from exposure to cold.—*Id.*

Contents of a Heron's Crop.—On Thursday last, the 25th, two male herons (Ardea cinerea) arrived from Norfolk at Mr. Swayland's, naturalist, to be stuffed. I was curious to ascertain the last dinner of these unusually fine birds. The first had stowed away in his œsophagus eleven perch, some of them five inches long, regardless of the sharp dorsal fin of that species: one of them has been preserved as a memento. The other heron had regaled himself with a nice little pike of eighteen inches in length, setting some formidable teeth at defiance; inside the pike again was another fish half digested, which appeared to me to be a roach of some five inches. The pike apparently had not long bolted his prey before "a long-winged heron great Minerva sent," but not with good omen. The roach in his turn had feasted on something; but, having followed the subject from its ardeine commencement, I here let it drop, as it was becoming rather nasty, though I believe it might have been pursued, according to what philosophers call the "sequence of events," somewhat further.—*Geo. Dawson Rowley; 5, Peel Terrace, Brighton, March* 27, 1869.

Purple Sandpiper in Suffolk.—A beautiful male of the purple sandpiper was shot at Gunton, near Lowestoft, on the 10th of November last: weight two ounces.—*T. E. Gunn; Norwich.*

Solitary Snipe near Norwich.—During last autumn a fine male bird was shot in this neighbourhood.—*Id.*

Sabine's Snipe (?) *at Christchurch.*—We have just had brought us a very good specimen of black snipe, which proves to be a female.—*W. Hart & Son; West End, Christchurch, Hants, March* 30, 1869.

Velvet Scoter in Norfolk.—A fine adult male was shot at Hunstanton on the 12th of February; it weighed 3 lbs. 6 oz. The stomach contained fragments of shells of small whelks, including four nearly entire.—*T. E. Gunn; Norwich.*

The Seasonal Plumage of the Divers (*Colymbidæ*).—I examined a very fine great northern diver a few days since, which was captured in a net in Megavissey Bay, and brought here alive: the nuptial plumage was very nearly perfected, but the head was intermixed with gray feathers which were rapidly giving way to the black feathers, on raising which the feathers were cropping up in every direction. There can be no doubt that the speckled plumage and the throat marks of the Colymbidæ are a seasonal livery, although the fact of several examples being seen in the autumn every now and then in this state of plumage, gives reason for thinking that after a certain age the summer plumage is retained perennially by old birds.—*Edward Hearle Rodd; Penzance, April* 30, 1869.

Dates of Arrival of Spring Visitors at or near Great Cotes, North Lincolnshire.—March 6th, Pied Wagtail. April 8th, Wheatear; 10th, Chimney Swallow; 12th, Yellow Wagtail, Tree Pipit and Willow Wren; 14th, Cuckoo; 15th, Sand Martin; 21st, Whinchat; 22nd, Whitethroat. May 2nd, Sedge Warbler; 4th, Swift; 7th, Garden Warbler. House Martin and Spotted Flycatcher, none seen up to this date. The Common Sandpiper arrived about the 22nd of April, but I failed to make a note of the exact day.—*John Cordeaux, Great Cotes, Ulceby.*

Curious position of Nest of Water Hen.—On April 23rd, as my brother and I were walking through the stack-yard of Stoughton Grange, we saw, in a small horse-pond, a male and female water hen and young sitting on some wood in the water: as we were watching the parent birds enticing their young out of sight under a stack of wood, and seeing the tiny black chicks scrambling over the wood, a young one suddenly dropped down violently from above with such force that it went several inches under water, partly stunning itself; quickly recovering, it paddled merrily away towards its parents, who were loudly calling: as we were extricating it from the wood, another dropped from above in like manner; looking up, we saw the nest on a tree stump overgrown with ivy, about twenty-five feet above the water, with three or four black little heads peeping out, and one or two newly-hatched young scrambling about the trunk, and presently another tumbled down: they could have been only a few hours hatched, and were quite unsuspicious of danger, as they swam directly to us and let us catch them without fear. I have known many of the nests built in trees, but none so high up; and it is curious that the young tumbled into the water of their own accord, on hearing the cry of their parents. Last year, in the planting just by, there was a nest of water hens in an elder tree, at a considerable distance from any water.—*Theodore C. Walker; Woodside, Leicester.*

Anecdote of Owls.—Last summer I got a young barn owl in the downy state from a gamekeeper, and about the same time an adult brown or tawny owl, which was winged, but injured so little that it could fly: I kept it to hear it hoot in the winter nights, but not a hoot could I make it utter. The white owl was always very tame, and as he got fledged he became a most entertaining pet: his cry was at first a kind of squeaking or wheezing noise, exactly like the noise of the stocking looms which are used in this part: this noise was uttered occasionally all day when young and hungry, but at night he was very clamorous: during the winter this noise ceased altogether,—the only cry he then uttered was a pleasing and very low whimper when he flew to meet me: he was exceedingly tame, in fact too tame, for on going to feed him at night he would fly to meet me, often knocking the candle out of my hand and settling on my shoulder, whimpering and pretending to bite; but often in settling on my head, my cap slipping off, he would stick his sharp claws into my ear, causing me to utter a very undignified squall. He had a most odd way of wriggling his head about from side to side, and up and down, and being so very tame we took him out in the garden, where he did not offer to fly away. One day my brother took him in the garden in the evening, when he flew straight off and could not be recovered: three days after, at seven o'clock in the morning, he came to my brother's bed-room window and knocked and flapped against the glass, when he caught it, but how he found his way back among so many houses I cannot imagine. The tawny owl, being an adult bird, never was so tame, but by kind treatment it let one put one's finger in its mouth, ruffle its feathers up and pull it about without anger, occasionally snapping its beak when extra-excited: it would never let any one see it feeding, and lived on good terms with the white owl and the kestrel hawks: on its first admission the white owl flew at it, and they dug their claws into each other's feet and screeched, but the tawny owl gaining the mastery; they ever after lived very amicably together: with the exception of that one screech and the usual snapping of its bill, I never heard it utter a sound.—*Theodore C. Walker.*

The Green Lizard at Torquay.—Having read in Mr. Newman's interesting article on British Reptiles in the 'Zoologist' for April (S.S. 1619) that the green lizard (*Lacerta viridis*) is of doubtful occurrence in Great Britain, I have the pleasure of sending to you for inspection a lizard which I suppose to be the above-named animal, together with the following data concerning it. It was brought to Mr. Shopland, the naturalist at Torre (Torquay), having been captured on the Rock Walk in the same town in July, 1860, in which locality several have been caught (two of which are in the Museum of Natural History in this town), and their occurrence is vaguely accounted for by their having been placed there by a gentleman many years ago. It was kept in confinement for four or five months by the same man. When alive its colours were far brighter, its back being of a vivid green shading off into dull yellow. I bought the specimen of Mr. Shopland, and should be much obliged if, on returning it, you will give me your opinion concerning it.—*A. de Hügel; Torquay.*

[I believe the specimen courteously sent for my inspection to be one of Lacerta viridis, but the distinguishing colour has entirely faded, and its place is supplied by a uniform olive-green. After the very candid manner in which Baron de Hügel has expressed his doubts as to the claim of this specimen to be considered indigenous I need add no opinion of my own.—*E. N.*]

Early Appearance of Reptiles.—I see in the 'Zoologist' for March (S. S. 1593), you have commenced "Observations on British Reptiles," so perhaps it may not be uninteresting to you to know that, on the 13th of February, I saw two blind-worms basking in the sun, and that on touching them with my stick they immediately started off with as much activity as they usually show during the warmer months of the year. On the following Thursday (the 18th) I saw and killed, near the same spot, an adder of about the average length; it had apparently recently shed its skin, as it was the most vivid in colouring I ever saw, and perfectly active in its movements. On the same day, and also at the same spot where I saw the first blind-worms, there was another, or rather part of another, for on taking it up I found that on some former occasion it had thrown off its tail, and that a (to me) very remarkable process was going on in the repairing of the injury: about an inch of the skin appeared to have lost its vitality, but still adhered to the body, forming a case of the natural size of the reptile: on looking into it the end, or tail, appeared to be perfectly sound, but whether it would have grown to its former length is more than I can assert. A newspaper paragraph stated that two full-grown adders had been killed near Fowey, about nine miles from this place, a week before I fell in with the one I killed.—*Stephen Clogg; East Looe, March* 2, 1869.

Scyllarus arctus in Berry.—By the kindness of Humphry Davy, Esq., of this place, I have obtained Scyllarus arctus alive and in berry: it was taken in a crab-pot at Long Rock, near this place, and its capture establishes beyond all doubt that this Mediterranean crustacean breeds in Mount's Bay. It is the second specimen taken in the Bay alive to my knowledge, but the first I ever saw living. It was taken off the same rocks on which Dr. Borlase (*vide* his 'Natural History of Cornwall,' p. 274) found that fine shrimp "Squilla lata Rondeletii." It is impossible now to ascertain whether Dr. Borlase was quite correct in the name of his specimen, but looking at the fact that we have taken Scyllarus arctus in the same locality as his "shrimp," and to the fact that Pennant (vol. iv., p. 17, lobster 23) identifies "Sq. lata Rondel." with his "Homarus arctus," and describes the latter as "Size of the spring lobster," it is probable that the doctor was mistaken and that his specimen was S. arctus also.—*Thomas Cornish; Penzance, April* 23, 1869.

Note on the Phosphorescence of the Lobster after Death.—I have just been reading Phipson on Phosphorescence, a work which is I believe held to be an authority on the subject. In Part 3 he treats of emission of light by dead animal matter; but he does not allude to the common lobster as an instance of this. On April the 24th I purchased at Norwood a lobster, which had been boiled on the previous afternoon, and which was therefore perfectly fresh. On April the 25th, in the afternoon, the said lobster was cut up and put in the dish in the usual manner for the table; it was then stowed away in the larder, which is a cool airy place, where the thermometer at the time stood at about 56° Fahr.: in the evening, the cook having gone out, the table-servant went to the larder in the dark to bring it to table; she was startled by what she thought to be the pair of eyes of a cat which had stolen into the larder; on looking more attentively she saw that it was the lobster shining in the dish. She brought it to table and left it, whilst she announced supper: meanwhile a member of the family going into the dark room saw the lobster shining in the dish, and called us all in. The dry shell of the crustacean did not shine at all, but all the moist interior, as also the juice in the dish. This latter was so luminous that a drop taken on the finger shone, as also when let fall on the table-cloth. Every moist part of the creature appeared to be luminous, and the luminous portion presented an oily feeling. I do not attribute much importance to this last fact, as this juice always, more or less, presents a similar appearance. Of course, on a light being brought in, the phosphorescence could not be observed; but in the dark it was very brilliant, and I have thought it worthy of a note.—*C. Horne; Upper Norwood, April* 26, 1869.

P.S.—All appearance of phosphorescence had vanished next morning, as I tested by placing the remains in a dark cellar. I believe that a free current of air greatly enhances the collection of phosphoric matter, if it be such. My fishmonger tells me that most sea-fish become thus luminous, many of them within half an hour after dark, and others at a later date. Notes on this subject from others of your correspondents, who living at the seaside have a better opportunity of observing, would be very interesting.—*C. H.*

PROCEEDINGS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY.

May 3, 1869.—H. W. BATES, Esq., President, in the chair.

Donations to the Library.

The following donations were announced, and thanks voted to the donors:—'Proceedings of the Royal Society,' No. 110; presented by the Society. 'Journal of the Quekett Microscopical Club,' No. 6; by the Club. 'Annales de la Société Linnéenne de Lyon,' vol. xvi.; by the Society. 'Verhandlungen der k. k. zool-bot. Gesellschaft in Wien,' vol. xviii., Parts 1 and 2; by the Society. 'Bulletin de la Société Imp. des Naturalistes de Moscou,' 1868, No. 2; by the Society. 'Beitrag zur Kenntniss der Coleopteren-Fauna der Balearen,' by Dr. Schaufuss. Hewitson's 'Exotic Butterflies,' Part 70; by W. W. Saunders, Esq. 'The Zoologist' for May; by the Editor. 'The Entomologist's Monthly Magazine' for May; by the Editor.

Election of Member.

Charles Owen Waterhouse, Esq., of the British Museum, was ballotted for, and elected a Member.

Exhibitions, &c.

Mr. S. Stevens exhibited a large collection of Coleoptera, sent from China by Mr. Pullinger; and read an extract from a Report on the Coffee Plantations of India, to the effect that the planters had not discovered any remedy for or preventive of the ravages of the coffee-borer, Xylotrechus quadripes.

Mr. Dunning exhibited a specimen of the common Cetonia aurata, found in a garden at New Cross on the 11th April; it was partly covered with earth, and appeared to have just emerged from its underground hybernaculum, whence it had been prematurely tempted by the first warmth of spring.

Mr. Butler mentioned that the Conocephalus from West Africa, which he exhibited on the 15th February was still alive; he had kept it in a box on a mantelshelf at the British Museum, where it remained motionless unless disturbed, and had not eaten anything whatever.

Prof. Westwood exhibited three species of Epyris and some other Hymenoptera of doubtful position, having relations with the Proctotrupidæ, the Chrysididæ, and some of the Scoliidæ; and a Calyoza from Port Natal, with pectinate antennæ having thirteen joints in both sexes; this was identical with an insect found in gum animé, and described in Trans. Ent. Soc. ii. 56 (where the male was represented as having only twelve joints to the antennæ).

Mr. Frederick Smith exhibited both sexes of Cynips, the male of which had at last been detected by Mr. Walsh in America. The oak-apples on the black oak (Quercus tinctoria) are first observed in May, and reach their full growth in a few weeks; by the middle of June, male and female gall-flies (Cynips quercus-spongifica, *Osten-Sacken*) emerge from a small proportion of them, say one-fourth; the remaining three-fourths do not develop flies until the autumn, and then produce gall-flies (C. q. aciculata) closely allied to, yet quite distinct from, those produced in June, and out of thousands of the autumnal flies which were examined not one was a male. Mr. Walsh placed some of the autumnal form (C. q. aciculata) on oak-trees, and they created galls, from some of which were obtained the spring form (C. q. spongifica), whilst a few produced the autumnal form (C. q. aciculata), and all the latter were females. These last again were placed on isolated oaks, galls were formed by their puncturing, and from these the spring form (C. q. spongifica) was again obtained. From which observations it was to be inferred that the two forms are not distinct species, but dimorphous forms of the same species. From the red oak (Quercus inanis) a different gall was obtained, smaller than the former, and the central cell not woody: from these galls came male and female gall-flies (Cynips quercus-inanis, *Osten-Sacken*), which were undistinguishable from the spring form of C. q. spongifica, but no autumnal form of this fly had been discovered. Mr. Walsh felt himself compelled to consider the flies distinct, because the galls were different and were obtained from distinct species of oak; but the gall-flies were exactly alike. An account of Mr. Walsh's observations had been given in "The American Entomologist," of which Mr. Smith mentioned that, though 6000 copies were struck off, the early numbers were already out of print.

Mr. Charles Horne stated the result of his observations in India on various insects, as regards their liability to or freedom from the attacks of animals, birds, lizards, &c. In corroboration of his previous statement (S. S. 1648) he might mention that the brown or yellow bear (Ursus isabellinus) was described by Dr. Jerdon as eating scorpions, insects, honey and fruit; the Himalayan black bear (U. Tibetanus) was very fond of locusts, but with this exception did not affect insects; the black bear (U. labiatus) was said to "suck the grubs of large Longicorns" in the Neilgherries, having first dug them out of the soil, but this bear was not found among the hills of the North-West Provinces, and Mr. Horne was not personally acquainted with its habits. Anthia quadrimaculata, all the species of Blaps, and all the observed Mylabridæ and Geotrupidæ, were refused by everything. A brightly coloured locust was refused by birds and lizards; it exuded a yellow acrid juice with a pungent odour. The wingless female Lampyridæ were not eaten, though perhaps the males might be. Small round hard Coleoptera, and Mantispæ, were refused by the Gecko lizards, which were otherwise omnivorous. Termites in all their stages, and migratory locusts, were generally eaten by birds, frogs and lizards; even the smallest birds would take locusts, as would also squirrels and mice. Hemiptera were generally refused. Mantidæ were freely eaten by birds. Merops viridis and other birds eat bees; the honey-buzzard tears off the comb of bees and wasps, and heedless of their stings sits and eats the honey, wax, grubs, and all. Crows eat all visible caterpillars, but prefer smooth-bodied ones. King-crows (Dicrurus) eat all insects on the wing; a large fat-bodied moth with red under-wings was a great favourite with them. Sparrows delight in the Noctuidæ; so do the hunting spiders, and Mr. Horne was at a loss to understand why the spiders were not carried off by the moths. Most of the thrush tribe gobble up almost indiscriminately every insect or caterpillar they find. Sparrows had been seen to refuse cockroaches, but other birds would eat them. Most of the Blattidæ were rejected by birds. The Ichneumonidæ appeared to enjoy immunity from the attacks of birds, which Mr. Horne attributed chiefly to an acrid smell which most of them emitted. He had seen Dytiscidæ taken by birds, and dropped from inability to eat them. Iulidæ were totally rejected by all animals and birds.

Mr. Horne also mentioned that he had once known a large spider (or rather a Galeodes) killed by the sting of a wasp upon which he was feeding; the Galeodes finished his meal, but sickened and died shortly after. He inquired whether it was from fear, or for the purpose of annoyance, that humble-bees eject fluid when disturbed; and mentioned a similar occurrence which he observed in a hornet at Benares: the hornet was on a window, and, on being touched with a pencil, ejected a clear fluid along the glass, in several lines of from one inch to two inches in length. Mr. Horne also exhibited a sketch from nature of a moth and a hunting spider: the moth was at rest on a small bamboo in a summer-house, and the spider was quietly feeding upon the moth; the question was, how did the spider catch and hold the moth, without any disturbance of the latter? The moth must have been alive when the spider seized him, for the spider would not have cared to suck a dead body.

Mr. M'Lachlan had seen a Phalangium which had captured, and held in captivity, a Plusia Gamma under similar circumstances.

Mr. M'Lachlan exhibited a white ant which had been brought in all its stages by Mr. Melliss from St. Helena. (See Proc. Ent. Soc. 1863, p. 185; 1866, p. xii.) The insect was said to have been introduced into the island from the coast of Africa, but it was not referable to any described African species; it had rather the appearance of a West Indian or Brazilian species, and resembled the Termes tenuis of Dr. Hagen.

Mr. M'Lachlan also exhibited a number of black Poduræ, probably the same species as that exhibited by Mr. G. S. Saunders (Proc. Ent. Soc. 1867, p. lxxxv), the Anura tuberculata of Templeton: the so-called "blight" fell over a duck-pond and farm-yard near Hungerford on the 10th April, and looked just as if a sack of soot had been emptied out; it floated for some time on the pond, but soon disappeared from the farm-yard. Mr. M'Lachlan added that he had only that morning found a number of small white Poduræ in his own house at Lewisham: some flowers were in a room, one of the flower-pots had been removed, leaving a saucer containing water, on the top of which the spring-tails were floating; but on returning two or three hours later they were all drowned.

Prof. Westwood suggested that they must have passed from the flower-pot into the water before the removal of the former; and Mr. Jenner Weir said that during the present spring he had observed them on several occasions under flower-pots.

Papers read.

The following papers were read:—

7 JY69

"Notes on Eastern Butterflies," (Continuation, on the genus Diadema); by Mr. Alfred R. Wallace.

"Descriptions of new or little-known Forms of Diurnal Lepidoptera;" by Mr. A. G. Butler.

New Part of 'Transactions.'

The first part of the "Transactions for 1869" (published in April) was on the table.—*J. W. D.*

CONTENTS.

Notes on the Zoology of Newfoundland, *Henry Reeks*, 1689.

Notes on some of the rarer Birds noticed in Suffolk in 1868, *Alexander Clark-Kennedy*, 1695.

About Shells, *Charles Wright*, 1700.

A Contribution towards the Life-history of Cecidomyia persicariæ, *Albert Müller*, 1705.

Collected Observations or British Reptiles, *Edward Newman*, 1707.

Quadrupeds.—Otter in Suffolk, *T. E. Gunn*, 1719. Mouse or Spider, *Stephen Clogg*, 1719. Musk Rat and Frog, *C. Horne, B. C. S.*, 1719.

Birds.—Ornithological Notes from South Devon, *A. de Hugel*, 1720. Osprey in Norfolk; Early nesting of the Barn Owl in Norfolk, *T. E. Gunn*, 1721. Ring Ousel at Muswell Hill, *Walter Smith*, 1721. Cirl Buntings and Crossbills in Devonshire; Crossbills in Surrey, *T. E. Gunn*, 1721. Name of a Finch, *H. T. Murdoch Kirby*, 1721. Hoopoes at the Land's End District, *Edward Hearle Rodd*, 1722. Cuckoo in Confinement, *Egbert D. Hamel*, 1722. Curious Malformed Beaks of the Woodpigeon and Ringed Plover; Vitality of a Turkey, *T. E. Gunn*, 1722. Contents of a Heron's Crop, *Geo. Dawson Rowley*, 1722. Purple Sandpiper in Suffolk; Solitary Snipe near Norwich, *T. E. Gunn*, 1722. Sabine's (?) Snipe at Christchurch, *W. Hart & Son*, 1722. Velvet Scoter in Norfolk, *T. E. Gunn*, 1722. The Seasonal Plumage of the Divers, *Edward Hearle Rodd*, 1723. Dates of Arrival of Spring Visitors at or near Great Cotes, North Lincolnshire, *John Cordeaux*, 1723. Curious position of Nest of Water Hen; Anecdote of Owls, *Theodore C. Walker*, 1723.

Reptiles.—The Green Lizard at Torquay, *A. de Hügel*; 1724. Early Appearance of Reptiles, *Stephen Clogg*, 1724.

Crustacea.—Scyllarus arctus in Berry, *Thomas Cornish*, 1725. Note on the Phosphorescence of the Lobster after Death, *C. Horne*, 1725.

Proceedings of Societies.—Entomological Society, 1726.

Communications signed John P. Thomasson, Anatole de Hügel, George Roberts, Gervase F. Mathew, Charles Stubbs, W. W. Verner, J. W. May, Edward Hearle Rodd, Murray A. Mathew, Henry Reeks, John Cordeaux and Edward Sweetapple, as well as an abstract of the Annual Report of the Zoological Society and the Fourth Chapter of my Essay on the Death of Species, stand over until July.—*E. N.*

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